

**Biomedical Research and
Public Health Summer School**

Module 3: Microbial Genomics & Metagenomics Workshop July 9th-13th 2012

The Microbial Genomics & Metagenomics Workshop is organized and taught in collaboration between the CSISP Genomics and Health Area and the DoE (U. S. Department of Energy) Joint Genome Institute (JGI), one of the largest genome centers in the world. The workshop will train participants in state-of-the-art analytical methods in genomics and metagenomics, following the content and hands-on teaching philosophy of the Microbial Genomics & Metagenomics Workshops held regularly at JGI, in Walnut Creek, California, since 2006.

The workshop is addressed to graduate students, professionals and practitioners of biology, biomedical research, the health sciences and related fields, who are interested in learning or sharing concepts, tools and research results in genomics and metagenomics. The workshop will consist of theoretical lectures and seminars as well as practical hands-on sessions in bioinformatics and biostatistics. Attendants are welcome to bring their own data to work on after class with instructors' guidance, as well as posters presenting their research.

Organizers

M. PILAR FRANCINO & NIKOS KYRPIDES

Instructors

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Workshop Outline

Monday July 9th

- 09:00 - 09:30 h. Welcome and Overview of the Workshop by DR. M. PILAR FRANCINO.
- 09:30 - 10:00 h. Features and Diversity of Microbial Genomes by DR. M. PILAR FRANCINO.
- 10:00 - 10:30 h. Bacterial genomics and metagenomics. A single-cell approach by DR. GIUSEPPE D'AURIA.
- Break**
- 10:45 - 11:45 h. Metagenomic and Metatranscriptomic Analyses of Bacterial Communities by DR. ALEJANDRO MIRA.
- 11:45 - 12:30 h. Viral Metagenomes by DR. VICENTE PÉREZ.
- Lunch**
- 13:30 - 15:00 h. Basic Tools of Bioinformatics by ALEJANDRO ARTACHO.
- Break**
- 15:15 - 16:45 h. Microbial Diversity Analyses with 16S rRNA by DR. YVONNE VALLÈS.

Tuesday July 10th

- 09:00 - 09:30 h. Sequencing Technologies by DR. ALEJANDRO MIRA.
- 09:30 - 10:00 h. Informatic Processing and Quality Control of Sequencing Reads by ALEJANDRO ARTACHO.
- 10:00 - 10:30 h. Sequence Assembly and Genome Finishing by DR. GIUSEPPE D'AURIA.
- Break**
- 10:45 - 12:15 h. Hands on Demonstration of Sequence QC and Assembly by ALEJANDRO ARTACHO and DR. GIUSEPPE D'AURIA.
- Lunch**
- 13:15 - 14:00 h. Introduction to JGI & IMG by DR NIKOS KYRPIDES.
- 14:00 - 14:30 h. IMG systems architecture by DR. VICTOR MARKOWITZ.
- 14:30 - 15:15 h. Finding Genes in Microbial Genomes by DR. NATALIA IVANOVA.
- Break**
- 15:30 - 16:15 h. Annotation: Data Sources, Function Prediction and Metabolic Reconstruction by DR. KONSTANTINOS MAVROMMATHIS.
- 16:15 - 17:00 h. Processing of Genomic & Metagenomic Datasets in IMG and IMG/M by DR. KONSTANTINOS MAVROMMATHIS.

Wednesday July 11th

- 09:00 - 09:30 h. Genome Project Standards and Metadata Curation by DR. KONSTANTINOS LIOLIOS.
- 09:30 - 10:30 h. Submission to GOLD and IMG by DR. KONSTANTINOS LIOLIOS.
- Break**
- 10:45 - 11:45 h. IMG Genomes: Live Demonstration by DR. NIKOS KYRPIDES.
- 11:45 - 12:30 h. IMG Genomes: Hands on Exercises (users).
- Lunch**
- 13:30 - 14:30 h. IMG Genes: Live Demonstration by DR. KOSTAS MAVROMMATHIS.
- 14:30 - 15:15 h. IMG Genes: Hands on Exercises (users).
- Break**
- 15:30 - 17:15 h. Poster Session

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Thursday July 12th

09:00 - 09:45 h. IMG Gene Context Analysis by DR. KONSTANTINOS MAVROMMATHIS.

09:45 - 10:30 h. Expression Data in IMG by DR. KONSTANTINOS MAVROMMATHIS.

Break

10:45 - 11:30 h. IMG Terms and Pathways by DR. NATALIA IVANOVA.

11:30 - 12:30 h. IMG Functions and Pathways: Live Demonstration by DR. NATALIA IVANOVA.

Lunch

13:30 - 14:15 h. IMG Functions and Pathways: Hands on Exercises (users).

14:15 - 14:45 h. A Genome Analysis Test Case by DR. KONSTANTINOS MAVROMMATHIS.

Break

15:00 - 16:00 h. MyIMG: IMG-ER Curation Environment by DR. NIKOS KYRPIDES.

16:00 - 16:45 h. MyIMG: Hands on Exercises (users).

Friday July 13th

09:00 - 09:30 h. Introduction to IMG/M by DR. NATALIA IVANOVA.

09:30 - 10:30 h. IMG/M: Metagenome Analysis - Live Demonstration by DR. NATALIA IVANOVA.

Break

10:45 - 11:30 h. IMG/M: Hands on Exercises (users).

11:30 - 12:00 h. A Metagenome Analysis Test Case by DR. NATALIA IVANOVA.

12:00 - 12:30 h. IMG/M-HMP by DR. VICTOR MARKOWITZ.

Lunch

13:30 - 15:00 h. Statistical Analysis of Metagenomic Datasets by DR. JUAN JOSÉ ABELLÁN.

Break

15:15 - 15:45 h. IMG Tutorial Postmortem by DR. VICTOR MARKOWITZ.

15:45 - 16:15 h. Open Discussion on IMG Future Features.

16:15 - 16:45 h. Conclusions and Health Perspective: The Human Microbiome by DR. M. PILAR FRANCINO.

Location

Centro Superior de Investigación en Salud Pública, CSISP.

Library (Second Floor)

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